Assimilating two soil moisture datasets ...

chain 11 posts since

Jun 25, 2008 I will eventually be attempting to assimilate both AMSR-E soil moisture retrievals and a thermal-IR retrieved soil moisture product into LISv5.0 (EnKF).

Is it possible to have two seperate observation datasets assimilated within the same assimilation run, and if so what's the necessary changes that I need to make?

I should add that additionally I will be assimilating values in the other three soil layers of the NOAH LSM?

Thanks! Tags: lis, data, assimilation

sujay *118 posts since*
Sep 20, 2007 1. **Re: Assimilating two soil moisture datasets in LISv5.0** Aug 29, 2008 9:03 AM

Yes, The LIS data assimilation structure can assimilate different types of observations. I would first encourage you to develop some synthetic test cases that mimic your planned system. Primarily, you will need to develop an observation plugin for this "hybrid" data (AMSR+thremal-IR+rootzone obs).

-S

chain *11 posts since*
Jun 25, 2008 2. **Re: Assimilating two soil moisture datasets in LISv5.0** Aug 29, 2008 2:21 PM

in response to: sujay Thanks Sujay!

So if I understand you correctly I will want to read all my observations with one "hybrid" observation plugin? I will essentially have 5 different observations:

a. 1st layer AMSR-E

b. 1st layer TIR

c. 2nd layer TIR

d. 3rd layer TIR

e. 4th layer TIR

and I will construct a routine to read those in, I will be doing all my re-mapping to the LIS grid prior to ingest.

I've looked through and ran the testcases for EnKF assimilation and the main thing I am unsure of is how does LIS know what type of observations I am assimilating, and thus updating the correct model state variables?

In addition to constructing an observation plugin, what additional changes will I expect to make to the LIS code?

I know I must add my additional dataset attributes to a file similar to:

synSM_attribs.txt

synSM_pertattribs.txt

I know I'm asking pretty broad questions but I want to know if there are obvious changes that I will need to make that I may initially overlook?

Thanks again, I really appreciate the help!

Chris

sujay *118 posts since*
Sep 20, 2007 3. **Re: Assimilating two soil moisture datasets in LISv5.0** Sep 15, 2008 2:59 PM

in response to: chain Hi Chris,

Yes. A hybrid observation plugin is needed that reads all the data that you list here. The attributes files (related to observations) should be sufficient for the specification of this hybrid obs. The EnKF is already setup to handle multiple observations. I have to warn you that you are the first one to try this. So we need to work together to make sure that the software is working properly. As I said before, it will be good to develop a synthetic identical twin experiment to test this out. I would try assimilating the soil moistures from the 4 soil layers of Noah as observations.

-S

chain *11 posts since*
Jun 25, 2008 4. **Re: Assimilating two soil moisture datasets in LISv5.0** Sep 15, 2008 5:05 PM

in response to: sujay Thanks Sujay!

I've been working on building a system that reads in synthetic data for the 4 layers in the NOAH LSM. But before I got to that I've been trying to assimilate just one layer in layer 3 of the NOAH LSM rather than layer 1 in the NOAH EnKF test case, I don't understand how the LIS code knows what soil layer the observation is for? I think once I get that understood I can move to assimilating multiple layer observations, and at that point just let me know if there are tests that I can run to let you know that everything is working with multiple observation assimilation.

Chris